

# Interview with Zoë Schläger on NPR

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## On the concept of plant “intelligence”

Intelligence is this thing that's loaded with so much human meaning. It's too muddled up sometimes with academic notions of intelligence. ... Is this even something we want to layer on to plants? And that's something that I hear a lot of plant scientists talk about. They recognize more than anyone that plants are not little humans. They don't want their subjects to be reduced in a way to human tropes or human standards of either of those things.

## On the debate over if plants have nervous systems

I was able to go to a lab in Wisconsin where there [were] plants that had ... been engineered to glow, but only to glow when they've been touched. So I used tweezers to pinch a plant on its vein, ... the kind of mid-rib of a leaf. And I got to watch this glowing green signal emanate from the point where I pinch the plant out to the whole rest of the plant. Within two minutes, the whole plant had received a signal of my touch, of my "assault," so to speak, with these tweezers. And research like that is leading people within the plant sciences, but also people who work on neurobiology in people to question whether or not it's time to expand the notion of a nervous system.

## On if plants feel pain

We have nothing at the moment to suggest that plants feel pain, but do they sense being touched, or sense being eaten, and respond with a flurry of defensive chemicals that suggest that they really want to prevent whatever's going on from continuing? Absolutely. So this is where we get into tricky territory. Do we ascribe human concepts like pain ... to a plant, even though it has no brain? And we can't ask it if it feels pain. We have not found pain receptors in a plant. But then again, I mean, the devil's advocate view here is that we only found the mechanoreceptors for pain in humans, like, fairly recently. But we do know plants are receiving inputs all the time. They know when a caterpillar is chewing on them, and they will respond with aggressive defensiveness. They will do wild things to keep that caterpillar from destroying them further.

## On how plants communicate with each other

The primary way plants communicate with each other is through a language, so to speak, of chemical gasses. ... And there's little pores on plants that are microscopic. And under the microscope, they look like little fish lips. ... And they open to release these gasses. And those gasses contain information. So when a plant is being eaten or knocked over by an animal or hit by wind too hard, it will release an alarm call that other plants in the area can pick up on. And this alarm call can travel pretty long distances, and the plants that receive it will prime their immune systems and their defense systems to be ready for this invasion, for this group of



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Heather Sten/Harper Collins

chewing animals before they even arrive. So it's a way of saving themselves, and it makes evolutionary sense. If you're a plant, you don't want to be standing out in a field alone, so to speak. It's not good for reproductive fitness. It's not good for attracting pollinators. It's often in the interest of plants to warn their neighbors of attacks like this.

### **On plant "memory"**

There's one concept that I think is very beautiful, called the "memory of winter." And that's this thing where many plants, most of our fruit trees, for example, have to have the "memory," so to speak, of a certain number of days of cold in the winter in order to bloom in the spring. It's not enough that the warm weather comes. They have to get this profound cold period as well, which means to some extent they're counting. They're counting the elapsed days of cold and then the elapsed days of warmth to make sure they're also not necessarily emerging in a freak warm spell in February. This does sometimes happen, of course. We hear stories about farmers losing their crops to freak warm spells. But there is evidence to suggest there's parts of plants physiology that helps them record this information. But much like in people, we don't quite know the substrate of that memory. We can't quite locate where or how it's possibly being recorded.

### **On not anthropomorphizing plants**

Now when I go into a park, I feel totally surrounded by little aliens. I know that there is immense plant drama happening all over the place around me.

What's interesting is that scientists and botany journals will do somersaults to avoid using human language for plants. And I totally get why. But when you go meet them in their labs, they are willing to anthropomorphize the heck out of their study subjects. They'll say things like, "Oh, the plants hate when I do that." Or, "They really like this when I do this or they like this treatment." I once heard a scientist talk about, "We're going to go torture the plant again." So they're perfectly willing to do that in private. And the reason for that is not because they're holding some secret about how plants are actually just little humans. It's that they've already resolved that complexity in their mind. They trust themselves to not be reducing their subjects to human, simplistic human tropes. And that's going to be a task for all of us to somehow come to that place.

It's a real challenge for me. So much of what I was learning while doing research for this book was super intangible. You can't see a plant communicating, you can't watch a plant priming its immune system or manipulating an insect. A lot of these things are happening in invisible ways. ... Now when I go into a park, I feel totally surrounded by little aliens. I know that there is immense plant drama happening all over the place around me.

SAM BRIGER AND SUSAN NYAKUNDI PRODUCED AND EDITED THIS INTERVIEW FOR BROADCAST. BRIDGET BENTZ AND MOLLY SEAVY-NESPER ADAPTED IT FOR THE WEB.